

Webb 11/23/66
Gemini Awards ceremony

GEMINI EXPERIMENT RESULTS
ARE SUMMARIZED

"Although a predominantly engineering effort, Gemini performed a number of important scientific experiments.

The 43 different experiments carried out in the 10 manned Gemini flights included 14 from the scientific community, 12 from the Department of Defense, eight from the field of medicine, two technological and seven engineering experiments.

"As a result of Gemini flights we now have pictures of the zodiacal light -- the disk of light around the Sun in the ecliptic plane -- which cannot be clearly seen from Earth.

"A new Earth Atlas is coming out soon based on pictures taken from Geminis III, IV and V.

"On Geminis IX and X micrometeoroid experiments were very successful. We now have a better understanding of how many and what kinds of micrometeoroids we can expect to hit manned craft.

"When an astronaut brought back a micrometeoroid experiment from an Agena launch vehicle -- four months after it was put in orbit -- we found a micrometeoroid impact crater large enough to be seen with the naked eye.

"Gemini experiments have shown there is no degradation of an astronaut's visual acuity from space, at least over a period of two weeks.

"A nuclear emulsion experiment carried out on Gemini XI is giving us an increased understanding of the primary energetic particles in this galaxy's interplanetary space.

"Gemini 12 went a long way toward answering the question of how much a man can do in extravehicular activities without exhausting himself or endangering his health. Astronaut Aldrin -- with more than 5½ hours outside the Gemini XII hatch -- proved that with proper

padding and equipment, he could do constructive jobs outside an orbiting vehicle. Astronaut Lovell took the first photographs of a solar eclipse taken above the earth's atmosphere as the spacecraft passed over the Galapagos Islands off the west coast of Peru. A further outstanding achievement of Astronauts Lovell and Aldrin was their successful exercise in the gravity gradient experiment. We are all well pleased with the way they tackled the difficult job of stabilizing their Gemini spacecraft with the Agena, each at the end of the 100-foot long tether, and both pointing down toward the center of the earth. Because the Agena was at a lower altitude than the Gemini, it tended to travel faster in orbit, and the trick was to get the two vehicles stabilized in gravity to keep just the right tension of the tether without tumbling or having to burn fuel constantly to maintain position. This was done, and their success has important implications for future space station missions.

"Let me mention a few more of the accomplishments that have distinguished the Gemini program; some are significant to the advancement of our scientific knowledge, some to advancing our manned space flight program.

"An ultraviolet astronomical camera has given us a spectrogram of more than a hundred stars. For example, the spectrogram of Canopus, a solar-type star, shows a continuous spectrum crossed by dark lines which indicate the star's physical and chemical condition. This information is attainable only from outside the Earth atmosphere.

"Most of the experiments carried on Gemini flights had to be activated, controlled, or carried out by astronaut crews. In many cases, the success of the experiment depended on the observations of the astronauts and the correlation of these observations with other reported data.

"Medical experiments carried out in Gemini demonstrated that man can operate well in space for up to 14 days, and suggest that insofar as man is concerned, orbital missions of up to 30 days may be planned. The life support techniques and concepts developed for future space flight were validated. Gemini flights caused no noticeable changes in behavior; vestibular, metabolic and digestive and respiratory function remained normal.

"The photographs taken by astronauts in recent Gemini flights proved that remote sensing and photography from space are promising ways of learning more about the geological structure of the Earth in order to better utilize our resources, such as ground water, oil and mineral deposits.

"The color photographs taken in the Gemini flights indicate that valuable oceanographic data may be gathered from space to aid oceanographers in understanding such features of the world's oceans as river outflows, delineation of major ocean currents, the condition of the sea, and the drift of icebergs and pack ice."

James E. Webb
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